Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (original) A method for interpolative coding input signals, said signals decomposed into or composed of a slowly evolving waveform and a rapidly evolving waveform having a magnitude, the method incorporating at least one of the following steps:

(a) analysis-by-synthesis vector quantization of the rapidly evolving waveform parameter;

(b) parametrizing the magnitude of the rapidly evolving waveform;

(c) incorporating temporal weighting in the AbS VQ of the REW;

(d) incorporating spectral weighting in the AbS VQ of the REW;

(e) applying a filter to a vector quantizer codebook in the analysis-by-synthesis vector-quantization of the rapidly evolving waveform whereby to add self correlation to the codebook vectors; and

(f) using a coder in which a plurality of bits therein are allocated to the rapidly evolving waveform magnitude.

Claim 2 (original) The method of claim 1 further comprising analysis-by-synthesis vector quantization of the slowly evolving waveform.

Claim 3 (original) The method of claim 1 wherein said signal is speech.

Claim 4 (original) The method of claim 1 wherein said method incorporates each of steps (a) through (c).

Claim 5 (original) A method for interpolative coding input signals, said signals decomposed into or composed of a slowly evolving waveform and a rapidly evolving waveform having a magnitude, comprising:

(a) analysis-by-synthesis vector quantization of the rapidly evolving waveform parameter;

(b) analysis-by-synthesis quantization of the slowly evolving waveform;

(c) parametrizing the magnitude of the rapidly evolving waveform;

(d) incorporating temporal weighting in the analysis-by-synthesis vector quantization of the rapidly evolving waveform; and

(e) incorporating spectral weighting in the analysis-by-synthesis vector quantization of the rapidly evolving waveform.

Claim 6 (original) The method of claim 1 in which in the step of analysis-by-synthesis of a first vector-quantization of the slowly evolving waveform is predicted based on the vector quantization of the rapidly evolving waveform and a second vector quantization of the slowly evolving waveform.

Claim 7 (original) A method for interpolative coding input signals, said signals decomposed into or composed of a rapidly evolving waveform, comprising incorporating analysis-by-synthesis vector quantization of the rapidly evolving waveform parameter.

Claim 8 (original) A method for interpolative coding input signals, said signals decomposed into or composed of a slowly evolving waveform and a rapidly evolving waveform having a magnitude, comprising parametrizing the magnitude of the rapidly evolving waveform.

Claim 9 (currently amended) The method of claim 8 in which the method of parametrizing the magnitude of the rapidly evolving waveform is in accordance with the formula:

$$\widehat{R}(\omega,\xi)=\sum_{i=0}^{I-1}\widehat{\gamma}_i(\xi)\omega^i \quad , \quad 0\le\omega\le\pi \quad ; \quad 0\le\xi\le 1$$

where ω is the angular frequency, ~~and~~ I is the representation order, $\widehat{R}(\omega,\xi)$ is the parametric representation, $\widehat{\gamma}(\xi)=[\widehat{\gamma}_0(\xi),\ldots,\widehat{\gamma}_{I-1}(\xi)]^T$ is a parametric vector of coefficients within the representation model subspace, and ξ is the "unvoicing" parameter which is zero for a fully voiced spectrum, and one for a fully unvoiced spectrum.

Claim 10 (original) A method for interpolative coding input signals, said signals decomposed into or composed of a rapidly evolving waveform, comprising using a coder in which a plurality of bits therein are allocated to the rapidly evolving waveform magnitude.

Claim 11 (currently amended) ~~The method of claim 10, wherein~~ A method for interpolative coding input signals, said signals decomposed into or composed of a rapidly evolving waveform, comprising using a coder in which 7 bits are allocated to the rapidly evolving waveform magnitude in the coder.

Claim 12 currently amended) A method for interpolative coding input signals, comprising modeling vector by a set of basis functions and a piecewise linear model, ~~wherein~~ using a model interpolation factor is in accordance with the formula:

$$\alpha_{opt}=\frac{(\widehat{\gamma}_n-\widehat{\gamma}_{n-1})^T(\gamma-\widehat{\gamma}_{n-1})}{\left\|\widehat{\gamma}_n-\widehat{\gamma}_{n-1}\right\|^2} \qquad (19)$$

for non weighted distortion measure, ~~and is in accordance with~~ using the formula:

$$\alpha_{opt}=\frac{(\widehat{\gamma}_n-\widehat{\gamma}_{n-1})^T\Psi(\gamma-\widehat{\gamma}_{n-1})}{(\widehat{\gamma}_n-\widehat{\gamma}_{n-1})^T\Psi(\widehat{\gamma}_n-\widehat{\gamma}_{n-1})} \qquad \mathbf{(27)}$$

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for weighted distortion measure, ~~the~~ and using a model coefficient vector is in accordance with the formula:

$$\hat{\gamma}(\xi) = (1-\alpha_{opt})\hat{\gamma}_{n-1} + \alpha_{opt}\hat{\gamma}_n \qquad (16)$$, where

$$\alpha_{opt} = \frac{(\hat{\gamma}_n - \hat{\gamma}_{n-1})^T \Psi(\gamma - \hat{\gamma}_{n-1})}{(\hat{\gamma}_n - \hat{\gamma}_{n-1})^T \Psi(\hat{\gamma}_n - \hat{\gamma}_{n-1})}$$ and $\hat{\gamma}_n$ is the coefficient vector of the *n*-th REW magnitude function representation: $\hat{\gamma}_n = \hat{\gamma}(\hat{\xi}_n)$.

Claim 13 (currently amended) A method for interpolative coding input signals, comprising ~~of~~ using a weighted correlation matrix of orthonormal functions, $\Psi(W(\omega))$, where its elements are:

$$\Psi_{i,j}(W(\omega)) = \int_0^{\pi} W(\omega)\psi_i(\omega)\psi_j(\omega)d\omega , \qquad (23)$$, where $W(\omega)$ is the weighting and $0 \leq \omega \leq \pi$, in order to use an equivalent distortion, between two weighted vectors, in a model which uses representation of the vectors by a combination of basis functions.

Claim 14 (currently amended) The method of claim 13 ~~whithout~~ without using ~~the~~ the weighting $W(\omega)$, or assuming that the weighting is equal unity.

Claim 15 (currently amended) A method for interpolative coding input signals, comprising computing time-varying orthonormal basis function, whereby to eliminate using the matrix ψ, by defining the scalar product to incorporate the time-varying spectral weighting, wherein the respective orthonormal basis functions are in accordance with the formula:

$$\int_0^{\pi} W(\omega)\psi_i(\omega)\psi_j(\omega)d\omega = \delta(i-j) \qquad (28)$$

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where $\delta(i-j)$ denotes Kroneker delta and the respective parameter vector is in accordance with the formula:

$$\gamma = \int_0^\pi W(\omega)R(\omega)\psi(\omega)d\omega$$

(29), where $W(\omega)$ is the weighting and $0 \leq \omega \leq \pi$, and $R(\omega)$, is represented by a linear combination of orthonormal functions, $\psi_i(\omega)$:

$$R(\omega) = \sum_{i=0}^{I-1} \gamma_i \psi_i(\omega) \quad , \quad 0 \leq \omega \leq \pi \qquad (1)$$

where ω is the angular frequency, and I is the representation order.

Claim 16 (currently amended) A method for interpolative coding input signals, comprising using distortion in a form of a simple parameter squared error which is equivalent or related to complex distortion between vectors by using sensitivity function as weighting, $w_s(\xi(m))$, for the parameter squared error, that is in accordance with the formula:

$$w_s(\xi(m)) = \left(\frac{\partial \tilde{\gamma}}{\partial \xi}\right)^T \Psi \left(\frac{\partial \tilde{\gamma}}{\partial \xi}\right)\Bigg|_{\xi(m)}$$

(34), where ξ is the "unvoicing" parameter which is zero for a fully voiced spectrum, and one for a fully unvoiced spectrum,.

Claim 17 (original) A method for vector quantization of set of vectors using parametrization of each vector in the set, and applying vector quantization to the vector of parameters.

Claim 18 (original) The method of claim 17 using weighted distortion.

Claim 19 (currently amended) A method for dual (or higher order) prediction of vectors, comprising using both REW and SEW predictors.

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Claim 20 (currently amended) A method for dual (or higher order) predictive coding of vectors, comprising using both REW and SEW predictors.

Claim 21 (original) The method of claim 19 using Analysis-by-Synthesis.

Claim 22 (original) A method for predicting the slowly evolving waveform from both rapidly evolving waveform and past slowly evolving waveform data.

Claim 23 (original) A method for predictive coding of the slowly evolving waveform using both rapidly evolving waveform based prediction and past slowly evolving waveform prediction.

Claim 24 (original) A method of using codebooks for each subrange in subdivided parameter range in order to improve coding efficiency.

Claim 25 (currently amended) A method for interpolative coding input signals, comprising interpolating weighted distortion in accordance with the formula:

$$D_w\left(R, \hat{R}(\xi)\right) = \left(\gamma - (1-\alpha)\hat{\gamma}_{n-1} - \alpha\hat{\gamma}_n\right)^T \Psi\left(W(\omega)\right)\left(\gamma - (1-\alpha)\hat{\gamma}_{n-1} - \alpha\hat{\gamma}_n\right)$$
$$= \gamma^T \Psi \gamma + (1-\alpha)^2 \hat{\gamma}_{n-1}{}^T \Psi \hat{\gamma}_{n-1} + \alpha\hat{\gamma}_n{}^T \Psi \hat{\gamma}_n - 2(1-\alpha)\gamma^T \Psi \hat{\gamma}_{n-1} - 2\alpha\gamma^T \Psi \hat{\gamma}_n + 2\alpha(1-\alpha)\hat{\gamma}_{n-1} \Psi \hat{\gamma}_n$$

(26).

Claim 26 (currently amended) The method of claim 25 without using the weighting matrix Ψ, or assuming that the weighting is a unity matrix.

Claim 27 (currently amended) A method for interpolative coding input signals, comprising separating the total distortion to a sum of

modeling distortion and quantization distortion in accordance with the formula:

$$\sum_{m=1}^{M} D_w\left(R(m), \hat{R}(\xi(m))\right) = \sum_{m=1}^{M} D_w\left(R(m), \widehat{R}(\xi(m))\right) + \sum_{m=1}^{M} D_w\left(\widehat{R}(\xi(m)), \hat{R}(\hat{\xi}(m))\right)$$

(31).

Claim 28 (currently amended) A method for <u>interpolative coding input signals, comprising</u> ~~quantization~~ <u>quantizating</u> using simple quantization distortion, based on the separation method of claim 27.

Claim 29 (original) A speech coding system using waveform interpolation comprising at least one of the following steps:

(a) analysis-by-synthesis vector quantization of a rapidly evolving waveform parameter;

(b) parametrizing a magnitude of a rapidly evolving waveform;

(c) incorporating temporal weighting in the AbS VQ of the REW;

(d) incorporating spectral weighting in the AbS VQ of the REW;

(e) applying a filter to a vector quantizer codebook in the analysis-by-synthesis vector-quantization of the rapidly evolving waveform whereby to add self correlation to the codebook vectors; and

(f) using a coder in which a plurality of bits therein are allocated to the rapidly evolving waveform magnitude.

Claim 30 (original) A speech coding system using waveform interpolation comprising:

(a) analysis-by-synthesis vector quantization of a rapidly evolving waveform parameter;

(b) analysis-by-synthesis quantization of a slowly evolving waveform;

(c) parametrizing a magnitude of the rapidly evolving waveform;

(d) incorporating temporal weighting in the analysis-by-synthesis vector quantization of the rapidly evolving waveform; and

(e) incorporating spectral weighting in the analysis-by-synthesis vector quantization of the rapidly evolving waveform.

Claim 31 (original) A speech coding system using waveform interpolation of input signals, said signals decomposed into or composed of a rapidly evolving waveform, comprising incorporating analysis-by-synthesis vector quantization of the rapidly evolving waveform parameter.

Claim 32 (original) A speech coding system using waveform interpolation of input signals, said signals decomposed into or composed of a slowly evolving waveform and a rapidly evolving waveform having a magnitude, comprising parametrizing the magnitude of the rapidly evolving waveform.

Claim 33 (original) A speech coding system using waveform interpolation of input signals, said signals decomposed into or composed of a rapidly evolving waveform, comprising using a coder in which a plurality of bits therein are allocated to the rapidly evolving waveform magnitude.

Claim 34 (currently amended) A speech coding system using waveform interpolation comprising dual (or higher order) prediction of vectors, comprising using both REW and SEW predictors.

Claim 35 (currently amended) A speech coding system using waveform interpolation comprising dual (or higher order) predictive coding of vectors, comprising using both REW and SEW predictors.